Management Review of Occupational Safety and Health (OSH), Environmental (EMS) and Self Assessment (SA) Management Systems

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Collider-Accelerator Department September 10, 2003



Purpose

- Annually senior C-A management shall review its E and OSH performance, both qualitatively and quantitatively, for the purpose of identifying key improvement opportunities in these management systems
- C-A managers shall conduct an annual review of organizational performance versus objectives and measures defined in their self-assessment program



Management Review Agenda

- Critical outcomes and objectives in the contract
- Overview of C-AD programs that impact OSH/EMS/SA
- C-AD OSH/EMS/SA objectives and targets
- Compliance audit results
- Performance versus contract measures
- External and internal assessment of performance
- Review of FY02 Record of Decision and performance
- Injury/illness management
- Injury/illness and environmental performance
- Stakeholder concerns
- OSH and EMS related facility improvements
- Injury/illness and pollution prevention initiatives
- OSH/EMS/SA financial investments
- OSH/EMS/SA evaluation by senior management



FY03 Contract Critical Outcome

Science and Technology

BNL will deliver innovative, forefront science and technology aligned with DOE strategic goals in a safe, environmentally sound, and efficient manner, and will conceive, design, construct, and operate world-class user facilities



FY03 Contract Objectives

Objective 1.1 Quality in Research

- Science Success:
 - Produce original, creative scientific output
 - Achieve sustained progress and impact on the field
- Technology Success:
 - Show solid technical base for the work
 - Show intrinsic technical novelty of the research
 - Achieve important technical contributions
 - Achieve recognition from the technical community



FY03 Contract Objectives

Objective 1.3 Success in Constructing and Operating Research Facilities

- Construct new facilities on time and within budget
- Provide the next generation of research tools
- Ensure user access program is effective
- Effective leadership in SNS Project



FY03 Contract Objectives

Objective 1.4 Research Program Management

- High quality research plans
- Technical risks are adequately considered
- Optimal use of personnel, facilities, and equipment
- Success in meeting budget projections and milestones
- Effective decision-making in managing projects
- Success in overcoming technical problems
- Effective communication of technical results
- Effective transfer of intellectual property to industry
- Customer and stakeholder expectations are met



FY03 Contract Objective

Objective 3.3.2.1 Pollution Prevention

 Each organizational unit must demonstrate involvement in Pollution Prevention Program



FY03 Contract Objective

Objective 3.3.2.2 OSHA Reportable Injury Management

LWCR will improve to within 40% of the DOE average



Ed Lessard

- C-A mission and activities
- OSH/EMS aspects, objectives and targets
- OSH/EMS improvements
- OSH/EMS management systems status
- Questions answered:

What activities have significant OSH/EMS aspects?

What are the FY03 OSH/EMS objectives and targets?

What is the performance on the FY02 ROD?

What are the results of OSH/EMS performance measures?

What are concerns of stakeholders?



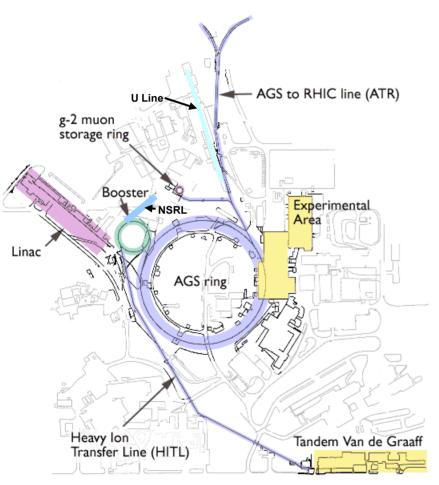
C-A Department Mission

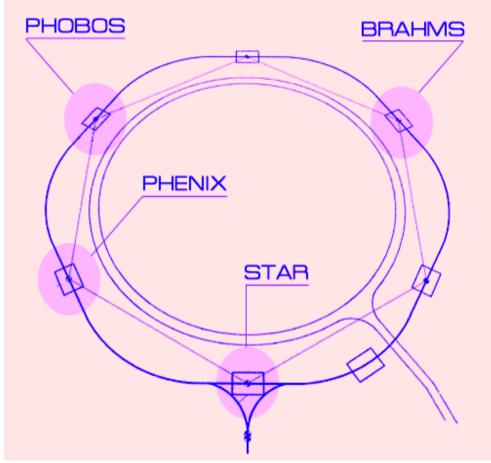
Mission

- Develop, improve and operate ion accelerators
- Support the experimental program
- Design and construct new accelerator facilities
- Excellence in environmental responsibility and safety



C-A Department Facilities







FY03 C-A Department Demographics

Category	~Number of people
	(NP, HEP, SNS, NSRL, experiments)
Scientific	48
Postdoctoral Fellows	2
Professionals	158
Technical	227
Administrative	25
Users	1683
Others (Students)	11
Total	2096



Significant E Aspects at C-A

- Regulated industrial waste
- Hazardous waste
- Radioactive waste
- Mixed waste
- Atmospheric discharges
- Liquid effluents
- Storage/use of chemicals or radioactive material
- Soil activation
- PCBs
- Environmental noise
- Water consumption > 650 K gals/day
- Power consumption > 58 M kW-h/year



C-AD E Objectives

- Integrate pollution prevention (P2) into work planning
- Demonstrate active involvement in BNL P2 Program
- Reduce generation of non-routine waste (spills)
- Meet environmental permit limits
- Comply with Liquid Effluents subject area
- Implement corrective actions for Article 12 conformance
- Conduct compliance assessments on a 3-y cycle
- Fully implement groundwater protection program



C-AD E Targets

- Monitor waste generation
- Submit two P2 project proposals
- Develop plan to reduce spills
- Minimize the number of reportable spills to < 3
- Review all experiments for E issues
- Prioritize Article 12 corrective actions
- Identify, label and inspect all registered tanks
- Identify, label and inspect outdoor storage areas
- Participate in Lab-wide compliance assessment
- Target zero impact on groundwater quality (caps)



Significant OSH Aspects at C-AD

- Ionizing radiation
- Non-Ionizing radiation
- Hazardous or toxic materials
- Radioactive materials
- Electrical energy
- Explosive gases and liquids
- Oxygen deficiency
- Kinetic energy
- Potential energy
- Thermal energy
- Cryogenic temperatures



C-AD OSH Objectives

Department-supported Objectives:

- An injury free workplace
- Compliance with OSH requirements
- Workers participate in all elements of OSH MS
- Achieve improved illness/injury performance
- Integrate OSH and EMS management systems



C-AD OSH Targets

Department-supported Targets:

- Reduce lost workday and total incidence rates
- Implement electrical safety corrective actions
- Establish a worker-based OSH committee
- Implement ILO-OSH-2001/OSHAS 18001
- Conduct an OSH/EMS/SA management review



Processes Evaluated for E Aspects

- Beam-line construction and disassembly
- Cooling water systems
- Electronic assembly operations
- Tech-shop operations
- Mechanical assembly operations
- Metal cleaning operations
- Plating operations
- Cryogenic system maintenance
- Vacuum lab operations
- Beam stops and beam collimators
- Magnet cleaning operations
- NSRL operations



Facilities Evaluated for OSH Aspects

- Workplace Hazard Analyses and Risk Assessments for:
 - Accelerators
 - Experimental areas
 - Offices
 - Shops



Example Page from OSH Evaluation

10. Injury/Illness Reduction Initiatives

Hazard ID	New OPM, Inspection Process, or Other Mechanism	ATS , ADS Number or Reference
Electrical Energy Hazards	Review electrical safety issues at C-A through an Ad Hoc Electrical Safety Review Committee.	ATS-1425
	Review and implement appropriate corrective actions recommended by Office of Independent Oversight during an Electrical Safety Review at C-AD.	ATS-1425.2
	Implement corrective action recommended by the Ad Hoc Committee; for example, implement a Web Based LOTO data entry/Tag system.	ATS-1425.1.8
Ionizing Radiation Hazards	Increase awareness of employees through the use C-A facility training emphasizing the use and requirements of RWPs.	<u>C-A Access</u> <u>Training Guide</u>
	Replace defective Siemens SRDs and distribute new SRDs to C-A personnel.	
	Conform to SBMS, Rad-Con, and DOE requirements for radiation safety.	<u>Radiation Safety</u> Link
Kinetic Energy Hazards	Increase employee awareness of safety through participation in Laboratory Safety Day.	
11 424143	Perform a management review of OSH.	OPM 1.10.4
	Increase safety and heath awareness and participation of all C-A staff through the implementation of C-A OSH. (OSH Management System Program Description)	OPM 1.10.4
Flammable and Combustible	Update of C-AD Accelerator Safety Envelopes for managing response to fire alarms.	OPM 2.5
Hazards	Perform and review emergency response drills at C-A.	ATS-1382
	Replace various Fire Alarm Panels in building 930.	ADS-AA2D0076

Training and Documentation Initiatives

- EMS re-training
 - Process specific re-training
- Authorization documents upgraded
 - C-AD SAD 50%
 - ASEs 90%
 - FHAs no progress
- OSH management system documents
 - OSH Management Plans
 - OSH Operational Controls Forms
 - OSH policy and audit procedures
- OSH facility-specific training



Authorization for New Operations

- NSRL facility
 - ASE approved by DOE (10-18-02)
 - ARR complete for commissioning (10-18-02)
 - DOE approved commissioning (10-18-02)
 - ARR complete for routine operations (6-18-03)
 - DOE approved routine operations (6-25-03)



E and OSH Improvements

- PLC upgrades for tritiated water systems
- Sealed floors at 1005 to comply with Article 12
- Indoor 2° containment and storage for tankers
- Radioactive Materials Storage Building
- Removed legacy waste
- Replaced defective self-reading dosimeters
- Web-based lock-out tag-out system
- Retaining wall erected to stabilize slope at Booster
- Booster storm-line capped and filled (September)
- B912 cleanup is 15 to 20% complete
- \$20K out of \$120K spent B930 fire alarm panel



Planned Facility Improvements

- Replace PCB capacitors at Linac
- Re-line cooling-tower basins
- Cap Linac activation areas
- Cap H-section of AGS Ring
- Cap all of AGS Ring
- Install liner inside Booster sanitary pipe
- Replace oil switches with air switches at B912
- Alter storm-water piping under H-10
- Continue to remove legacy waste from C-AD
- Restore water flow near AGS for fire protection
- Disconnect AGS fast-quad and add chillers



Planned Facility Improvements

- Eliminate open-vented tank on AGS cooling system
- Add ATR extraction magnets to AGS MM cooling system
- Add 2° containment to pipes for reference-magnet cooling
- Pave AGS steel-yard
- Remove and replace HVAC system at Building 940
- Repair B912 roof
- Apply 2° containment to outside piping at AGS RF Cavity
- Split buss cooling to reduce/eliminate tritiated F-10 water
- Complete B930 fire-alarm panel upgrade
- Upgrade remaining aging fire-alarm panels at C-AD
- Perform Fire Hazards Analyses and implement changes



FY02 Management Review ROD

- Ensure environmental impacts of fire are submitted in ADSs
- Define and allocate resources to remove legacy materials
- Dispose of the SREL magnet
- Review Engineering Evaluation for the g-2 plume
- Close g-2 Action Memorandum with EPA by targeted date



FY02 Management Review ROD

- Bring forward to upper management the following labwide issues:
 - BNL desperately is in need of a second Fire Safety Engineer
 - For greater efficiency, individual 90-day storage areas should be combined into one 90-day storage area located at WMD
 - BNL should examine and reduce waste management costs in a manner that reflects the actual cost of waste handling and disposal
 - SBMS should be modified such that external construction projects impacting a Department would require a Department's active involvement in the design, planning and approval process



Progress on FY02 Record of Decision

- ADS submitted with fire issues (e.g., B912 roof repair)
- Legacy materials defined and resources allocated
- SREL magnet removed
- g-2 EE/CA preferred alternative is long-term monitoring
- g-2 EE/CA to DOE in October and to EPA in January 04
- Second fire-protection engineer to start in October 03
- Single 90-day area studied by Office of IO and rejected
- Waste management costs are going down
- PE has involved C-AD prior to construction of basins

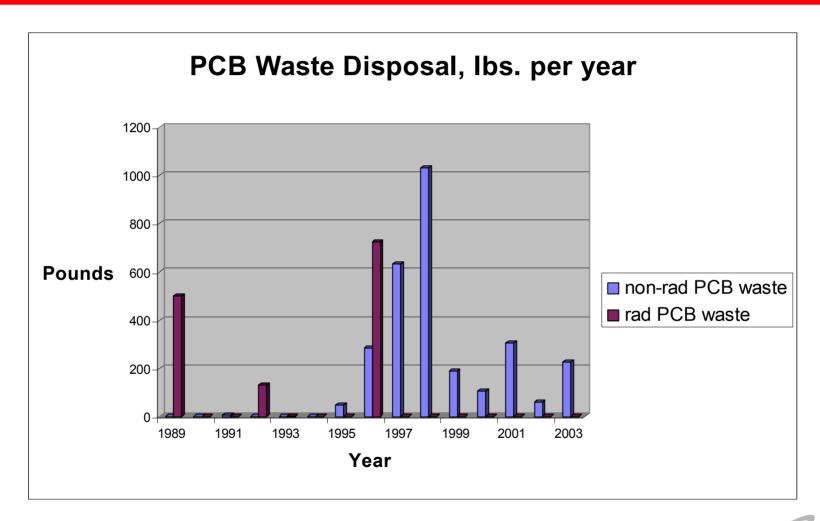


ISO14001 Registration

- FY 03 EMS task list completed
- All EMS documents updated
- All EMS documents controlled
- All EMS records identified
- ISO14001 registration maintained

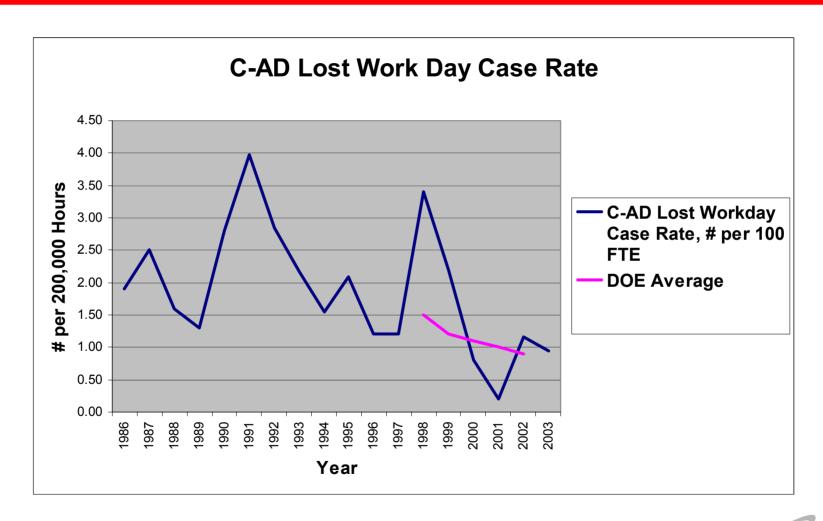


PCB Reduction



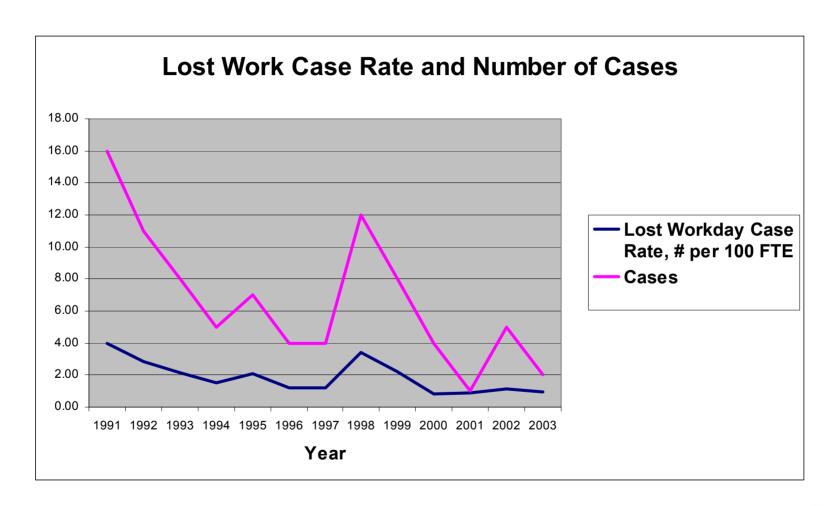


Injury / Illness Trend



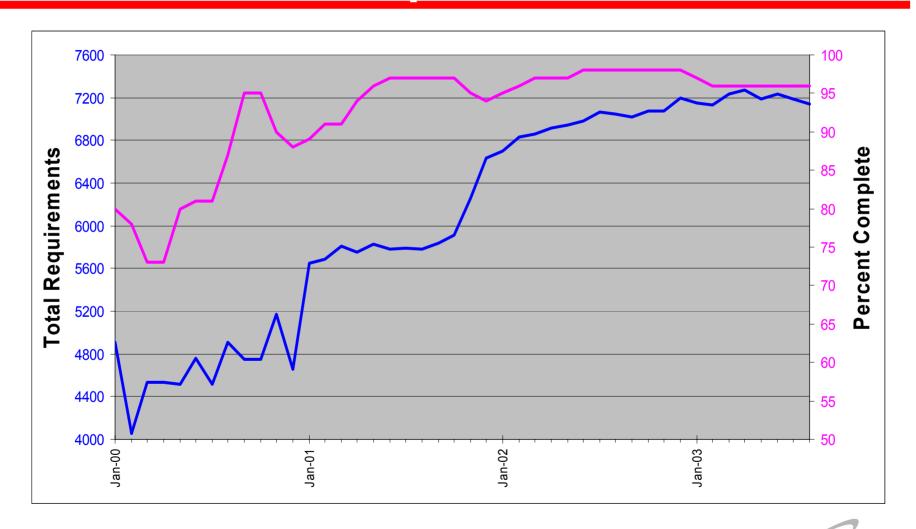


Injury / Illness Trend



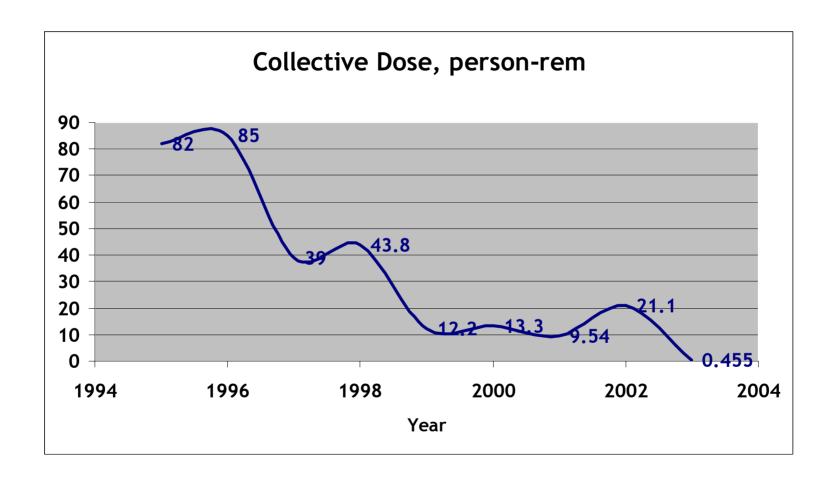


C-AD Training Requirements and Completions



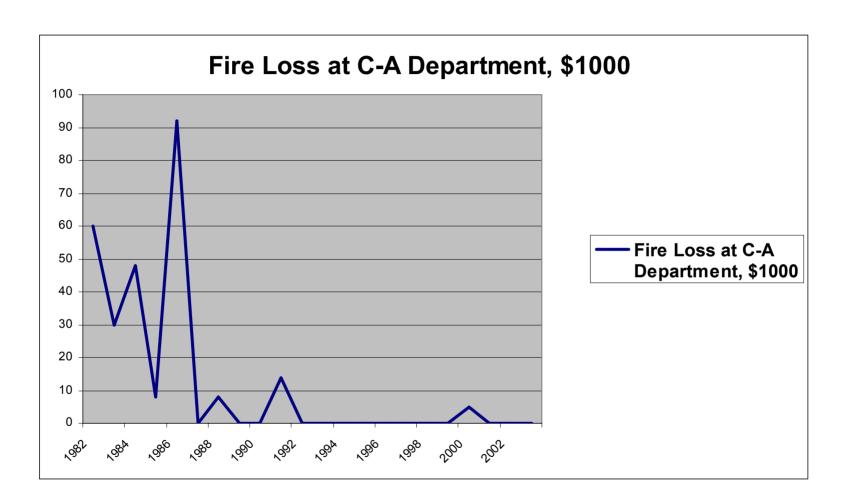


Radiological Dose Reduction Trend



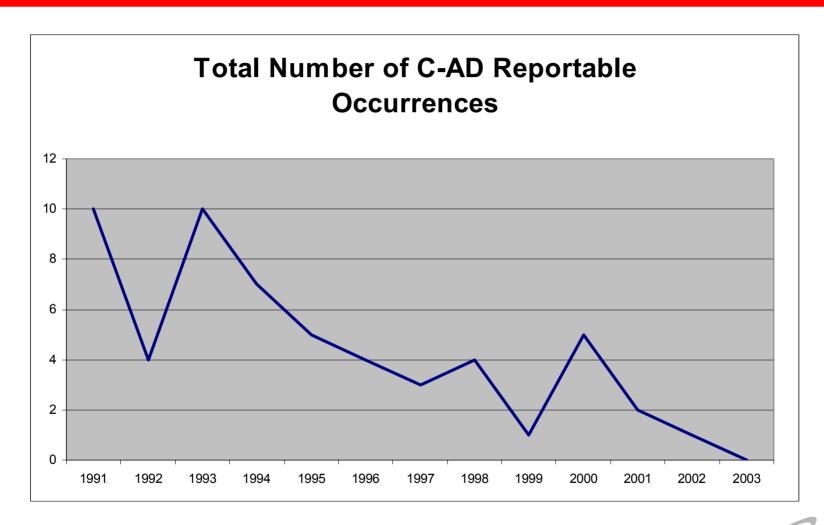


Fire Loss Trend





Occurrence Reduction





Stakeholder Concerns

- Community
 - g-2 tritium plume
- Regulators
 - g-2 tritium plume
 - External regulation
- Activists
 - None



Artie Piper

- Tier 1
- Self-evaluation program
- Occupational injuries



C-AD Tier 1

- Tier 1 inspections are similar to Occupational Safety and Health Administration (OSHA) inspections
- Weekly Tier 1 inspections cover over 100 buildings annually
- Findings tracked in ATS



C-AD Tier 1 Committee

Includes individuals with expertise in the following:

- Industrial safety
- Radiation protection
- Accelerators and accelerator experiments
- Mechanical engineering
- Electrical engineering
- Quality assurance
- Waste handling and environmental issues
- Building Manager
- The work (workers participate on a rotating basis)

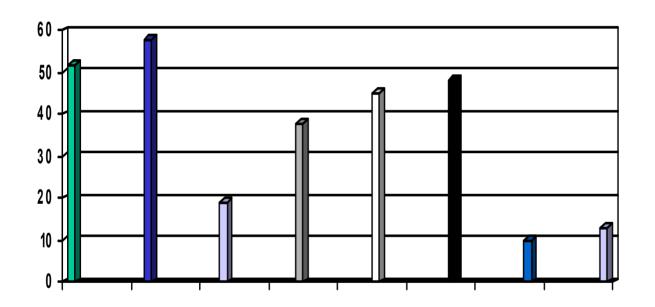


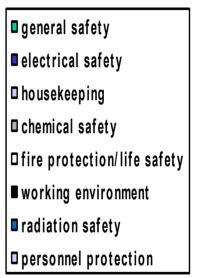
C-AD Tier 1 Process

- Reports distributed after inspection
- Findings assigned to responsible individual
- Fire-rescue run cards updated
- 32 Tier 1s conducted in FY2003 (to date)

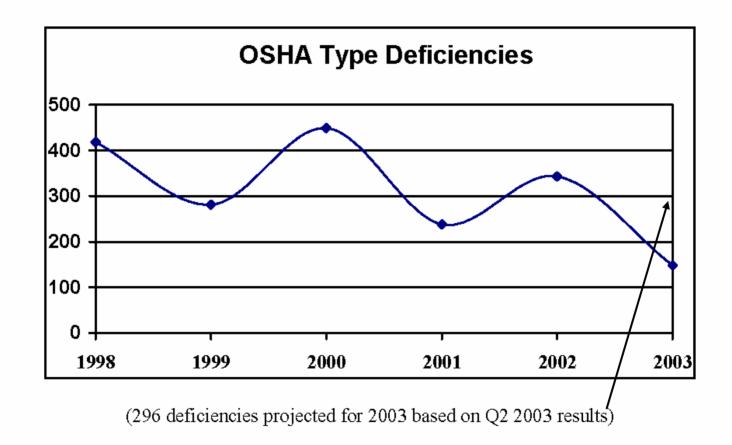


FY03 C-AD Tier 1 Findings (to date)





Tier 1 Deficiency-Frequency Trend





Significant OSHA-Type Concerns

- Numerous leaks in the roof structure of building 912 create electrical hazards, trip hazards, mold and general building infrastructure problems
- Aging fire protection and electrical distribution systems create fire hazards



C-AD Self-Evaluation Program

- Individuals assess tasks associated with their work and identify areas for improvement
- Management, supervisors and technical staff participate in the program



C-AD Self-Evaluation Program

- Twenty self-evaluations were performed in FY2003 (to date)
- Ten action items were identified
- Corrective actions tracked in ATS



Improvements in Injury Management

- Supervisors receive basic training for reporting and follow-up of occupational injuries
- New draft C-AD procedure will cover detailed aspects of restricted duty and injury management
- Staff will be trained on new procedure
- C-AD is proactively implementing ILO-OSH-2001
- WOSH Committee reviews injuries



FY03 C-AD Occupational Injuries

- First aid cases: 18
- Recordable cases: 3
- C-AD LWCR is 0.9 per 100 FTE
- BNL LWCR is 0.8 per 100 FTE
- DOE LWCR is 0.7 per 100 FTE
- C-AD has implemented ILO-OSH-2001 Management System to respond to the BNL Director's concerns over increasing injury's and workers compensation cases
- Ultimate plan is to align C-AD OSH Management System with requirements of VPP, be a model for BNL and seek 3rd party registration



FY03 C-AD First Aid Cases

Analysis of 18 first aid cases:

- 3 strains
- 14 lacerations/contusions
 - 4 were a direct result of snow/ice conditions
 - 1 was the result of standing water on floor of B912, standing water was due to roof leaks
- 1 chemical mishandling



FY03 C-AD Recordable Cases

Analysis of 3 recordable cases

- 2 back injuries
 - The 2 back injuries were the direct result of snow/ice conditions
- 1 knee injury
 - The knee injury was the result of voids in the parking area surfaces



C-AD OSH Program Description

- Four categories of facilities were analyzed
- Facility specific OSH operational controls developed
- Facility specific OSH management plans developed
- Facility specific OSH training developed
- Worker OSH Committee (WOSH) established
- Annual internal OSH audit required
- OSH records identified and tracked
- OSH analyses, procedures and policies annually updated
- Annual management review required



C-AD OSH Program Status

- Facility-specific OSH training modules in progress
- OSH action items from hazards analyses on track
- Internal OSH audit in progress
- WOSH Committee meets quarterly



C-AD LOTO Program

- C-AD has 37 LOTO OPM procedures required for specific/unique LOTO tasks
- A centralized database for LOTO padlocks is located in the C-AD safety engineering office
- Individuals who possess the required training receive a uniquely keyed padlock for LOTO



C-AD LOTO Program Improvement

- C-AD is implementing a web-based LOTO record keeping system
- The web-based system links specific LOTOs to procedures and other documents such as training records
- The LOTO status of the complex is centralized and readily available
- The new system produces LOTO tags, Caution Tags, ESH requirements, and checks training status for individuals assigned to perform LOTO



Role of Line Management in Ol

L. Sbarra, M.D.
OMC Manager
September 10, 2003



Goal of this Presentation

Understand the role of the supervisor (manager) in connection with Occupational Illness and Injury (OI)



Definitions

OI = Occupational Illness or Injury

<u>RD</u> = Restricted Duty (Light Duty)

- Written: BTW (back-to-work) slip or on a Restricted Duty slip
- Specific

<u>Limitation Sheet</u> = more (or less) enduring recommendations

- Issued after examinations
- Also may be updated following maximum (plateau) medical improvement or health changes
- Also updated on management request

Workers' Compensation (WC) v. OSHA recordable

- WC: (explain) payment for lost work days, medical care and disability loss awards (not same as CIGNA LTD)
- Recordability criteria pertain to OSHA requirements to track lost and restricted work days (re DOE)



What is management's role in OI?

- Ensure that all staff follow established safety procedures and maintain a safe working environment free from hazards
- SAFE WORK IS A CONDITION OF EMPLOYMENT!
- Address performance issues that may result in safety problems



What is management's role in OI?

- Accompany all employees to OMC in the event of an OI
 - Employees who appear at OMC without a member of supervision or a more senior manager will be asked to return later with manager unless medically inadvisable
- Concur with filing of OI reports (=dept concurs incident is related to work)
 - Communication of this to OMC nurse and Safety Engineering
- Complete <u>Accident Investigation</u> on a timely basis; follow-up any root causes (AI is line responsibility)

What is management's role in OI?

- Remain in <u>regular contact</u> with absent employees
 - weekly or as appropriate for supervisor
 - not substitute for OMC contact
 - avoid e mail and phone messages; personal contact by phone better
- Ensure that employees <u>notify OMC of ALL lost time</u>, including physical therapy, dr. visits, treatments, tests, surgery
- Ensure employees obtain <u>Back-to-Work slip from</u> <u>OMC for any lost time for OI</u>



Restricted (Light) Duty

- Provide <u>minimum 30 days restricted duty</u> (BNL policy) when requested in writing by OMC
- Be aware that OMC updates Restricted Duty on a minimum weekly basis
 - OMC tries to discontinue by Friday if at all possible
 - Can be shorter than weekly also (preferred)



Restricted (Light) Duty

- Refrain from unofficial restricted duty without OMC input or knowledge
 - Notes from employee's PCP's should be brought to OMC by employee
 - Manager should <u>provide RD in accordance with written</u> OMC recommendations
 - Not all restrictions require RD (if not within scope of work)
- May need to <u>extend restricted duty</u> beyond 30 days if appropriate; consider total restricted days (consistency) relative to OMC recommendations and discussion; discretionary but consistent



Other Points

- Make sure that <u>employees notify OMC if waiting for insurance authorizations</u> for tests, therapy or procedures (OMC facilitates authorization by WC insurance carrier- Liberty Mutual)
- Follow employee until back to work on full-duty



Last

- Assist OMC in accommodations <u>for those with</u> <u>enduring limitations</u> consistent with Laboratory policy:
 - Reasonable accommodation for essential job functions (ADA)
 - Transfer (explain effect on Cost Index)
 - LTD (vs. retirement)
 - Change FTE status (not)
 - Other employment?



Questions and Answers

- What should I do when an employee gives me doctor notes?
- What should I do if an employee seems ill or unfit for duty?
- When should I request a back-to-work slip?
- How is medical confidentiality handled at work?
- How do I request a medical evaluation from OMC?



Continued

- Must I make restricted duty available? How long should it last?
- What if an employee requires permanent accommodations?
- What should I do when employees tell me about their medical problems?
- What information is available to me concerning examinations and medical surveillance?



Dave Passarello

- Assessments
- Questions answered
 - What were the internal assessments about?
 - What were the external assessments about?
 - What are results?
 - How were findings dispositioned?



FY03 Self Assessment Plan

- Objective: provide a systematic approach to performance management
 - Ensure C-A's performance objectives are being met
 - Ensure improvement actions are identified and implemented



FY03 Self Assessment Metrics

Critical Outcome 1 Excellence in Science & Technology

Objective 1.1: Success in producing original, creative scientific output

Targets met by C-AD that support Objective 1.1:

- 1. Significant Accomplishments:
 - RHIC operated for the first time with unequal mass ion species
 - Polarized proton were delivered at 30% polarization and above design luminosity
 - NSRL started research operations
- 2. Significant awards: 2
- 3. Publications: 206
- 4. Patents and Disclosures: 6
- 5. Technical Committees: 57



FY03 Self Assessment Metrics

Critical Outcome 1 Excellence in Science & Technology

Objective 1.3: Success in Constructing & Operating Research Facilities

Targets met by C-AD that support Objective 1.3:

- 1. Budget & Schedule Performance:
 - All budgets were controlled and adhered to, cost plans were on target
- 2. Facility Performance:
 - RHIC technical goals for FY03 were all either achieved or exceeded
 - NSRL construction completed, four beams commissioned (C, Fe, Ti, H)
 - RHIC deuteron-gold and polarized proton beams became operational, all five experiments collected data and published
- 3. Facility Availability
 - NP (RHIC)= 77.95%
- 4. SNS:
 - BNL part of the SNS Project continued to meet all construction milestones at or below costs



FY03 Self Assessment Metrics

Critical Outcome 1 Excellence in Science & Technology

Objective 1.4: Effectiveness & Efficiency of Research Management

Example targets met by C-AD that support Objective 1.4:

- 1. Management Goals and Processes (5)
 - Continual improvement of Accelerator systems
 - Accelerator operations totally aligned with DOE mission
- 2. Significant Improvements in Infrastructure (7)
 - NSRL successfully commissioned and operational
- 3. Safety Enhancements (6)
 - Implementing the OSH Management System
- 4. Steps toward development of next generation facilities (6)
 - RHIC II, eRHIC
- 5. Projects/Programs Involving Collaborations with Others (13)
 - NASA radiobiology at AGS and NSRL
 - SNS Project



FY03 External Assessments

- ARR for NSRL
- BAO Independent (1)
 - Radiological Postings
- BAO/BNL Collaborative (2)
 - Storage and Transfer of Hazardous Material, Spill response
- BNL w/BAO Observing (4)
 - Interlock Protection, Beryllium, Ergonomics and EMS
- ERM audit of Laboratory EMS program
- NSF audit for ISO certification
- BNL IO Office (3)
 - Electrical Safety, Conduct of Operations, 90-day Accumulation Area
- C-A Facility Support Representative
 - Radioactive Material Areas
- Dupont OSHA Gap Analysis



FY03 Internal Assessments

- Department Self-Assessment
- EMS Assessment
- Environmental Management Review
- Occupational Health and Safety Assessment
- Critiques (including ad hoc Elect Safety Review Com) 14
- QA Assessments
- Tier 1 32
- Worker and Supervisor Self-Evaluations
- Outdoor Storage Areas4 scheduled
- Inspection of Satellite-Waste Stations
 12 scheduled
- Tank Inspections12 scheduled
- 90-Day Area Inspection52 scheduled



New C-A OSH Assessment

- Purpose: determine whether C-A's OSH management system and its elements are in place
 - First year: all 18 elements will be reviewed
 - Subsequent years: minimum of 6 elements reviewed



FY03 Internal Assessments Continued

Driver and description of required internal C-A assessments:

Perform assessments on C-A implementation of the following:

	• • • • • • • • • • • • • • • • • • •	•
•	Acquisition Management System	Completed
•	Environmental Management System	Completed
•	Facility Operations Management System	Completed
•	Life Cycle Asset Management System	In-progress
•	Safeguards and Security Management System	Completed
•	Worker Safety and Health Management System	In-progress

- DOE 2003 Office of Science Performance Plan:
 - C-A shall address 8 targets identified in the plan, for example
 - Operational downtime less than 10% of total scheduled operating time
 - Collect data with polarized protons
 - NASA facility to be completed in FY 2003



Status of Action Items

Internal

- Issued 463
- Percent Closed 68%

External

- Issued 172
- Percent Closed 94%



Closeout Process for Assessments

- Actions assigned to accountable individual(s)
- Internal action items entered in Family ATS
- External action items entered in Institutional or Family ATS
- Closeout requires concurrence of ESHQ Management

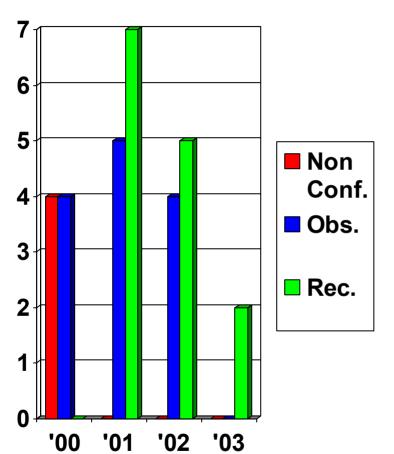


Mel Van Essendelft

- EMS Audits and Compliance Audits
- Pollution prevention initiatives
- Environmental performance
- Questions answered
 - What is the performance on compliance?
 - What are the pollution prevention initiatives?
 - What is the effluent/emission performance?



Internal EMS Audit



FY03 Opportunities for Improvement

- Identify objectives, targets and tasks differently to avoid misinterpretation
- Document the reason for revision when revising EMS documentation



Internal EMS Assessment

- Noteworthy practices observed during audit:
 - Cryogenics reduction in power consumption
 - Reduction in helium loss/usage
 - Improved focus on objectives and targets
 - Improved tracking of tasks to meet objectives
 - Excellent waste minimization through recycle and reuse
 - Commitment to fund and dispose of legacy wastes
 - Continual improvement by broadening management review



Lab-Level Internal EMS Assessment

- Lab-level Assessment performed by ERM with the following results:
 - Critical suppliers with environmental aspects should be identified and managed
 - Like for like equipment replacement doe not consider P2 opportunities
 - Targets should be more measurable to achieve continuous improvement
 - Root cause analysis needs greater integration
 - Tier I assessments did not always identify potential environmental concerns
 - Inconsistency in compliance with documented procedures



^{*} It should be noted that ERM results were addressed to the Laboratory and not to a specific department/division.

NSF ISO 14001 Audit

 No non-conformances, observations or recommendations at C-A from external EMS audit

This is two years in a row of excellent performance – KEEP UP THE GOOD WORK!!



- Spill Response Assessment
 - 3 Opportunities for improvement
 - The CAS group should have a portable spill kit
 - The water systems group should evaluate the need for new drain cover mats
 - Spill supplies should be replenished in 1005R and 922



- Tanks and Outdoor Storage Assessment
 - 2 Noteworthy Practices
 - C-A has an excellent system of engineered controls on its water systems
 - Water systems administrative controls are thorough and properly implemented
 - 1 Nonconformance
 - Several alarm systems are only getting circuitry tests and not operational checks



- Tanks and Outdoor Storage Assessment
 - 3 Observations
 - Some piping system upgrades to Article 12 have not had plans submitted to the County for approval
 - Staff unaware of the requirement to submit plans for approval 90-days before construction
 - Large-volume piping systems not labeled as described in the subject area



- PCB Compliance Review
 - Inspections performed and updated lists forwarded
- Air Emissions Compliance Review
 - Operating instructions and high fluid-level marking on part washers cited in audit - posted and marked



C-A Pollution Prevention Initiatives

In addition to the P2 items covered under Facility Improvements...

- Soil Coupon Program
- P2 proposal for digital equipment for NSRL



Environmental Performance

- SPDES discharge monitoring results
- Groundwater
- Air emissions
- Ambient radiation
- Spills



Wastewater Discharge to Outfalls

Analyte		Outfall 002B (RHIC)	Outfall HN (RHIC)	Outfall HO (AGS)	Outfall HT-e (LINAC)	Outfall HT-w (AGS)	SPDES Limit	No. of exceedances
рН	Min. Max.	7.2 8.6	6.3 9.4	6.7 7.8	7 8.3	7.2 8.2	- 9	1
Oil and Grease (mg/L)	Min. Max.	<5 <5	<5 <5	<5 <5	<1 <5	<5 <5	- 15	0
Hydroxyethylidene- diphosphonic Acid (mg/L)	Max.	0.13	0.1	NA	0.3	0.0	0.5	0
Tolytriazole (mg/L)	Max.	<0.005	<0.005	NA	<0.005	<0.005	0.2	0

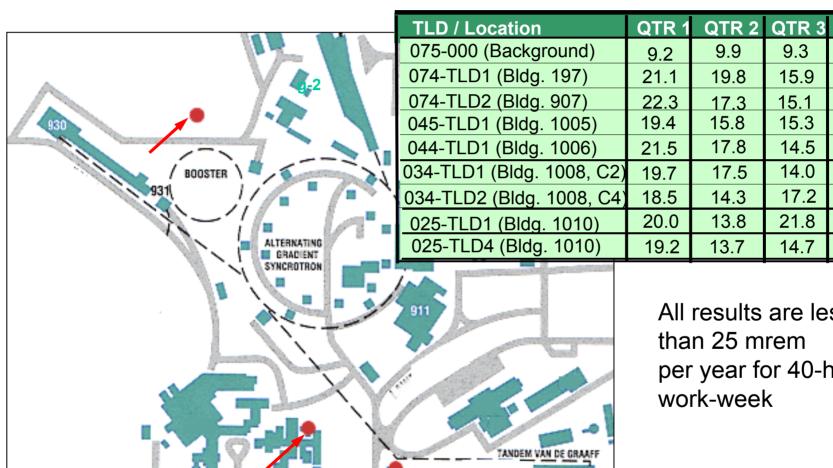
Water Quality for Recharge Basins

Location		Chlorides mg/L	Sulfates mg/L	Nitrate as N (b) mg/L
HN	Max.	27.6	20.1	<1
(RHIC Recharge)	Avg.	21.8	14.4	<1
HO	Max.	25.4	13.3	<1
(HFBR-AGS)	Avg.	20.7	12.2	<1
HT-e	Max.	23.7	13.0	<1
(AGS)	Avg.	18.5	11.7	<1
HT-w	Max.	28.0	13.3	<1
(LINAC)	Avg.	22.4	12.0	<1
NYSDEC Effluent Standard		500	500	10

Rad Results for Recharge Basins

Basin		Gross Alpha (pCi/L)	Gross Beta (pCi/L)	Tritium (pCi/L)
HN	Max.	2.40 ± 0.65	3.45 ± 0.94	< 386
	Avg.	1.18 ± 0.93	2.17 ± 1.31	131 ± 89
НО	Max.	5.06 ± 0.75	2.99 ± 1.07	<347
	Avg.	1.25 ± 2.53	1.40 ± 1.62	79 ± 41
HT-e	Max.	4.21 ± 0.73	5.03 ± 1.02	< 386
	Avg.	1.76 ± 2.13	1.54 ± 2.33	175 ± 123
HT-w	Max.	1.96 ± 0.63	3.60 ± 1.41	< 386
	Avg.	0.70 ± 1.08	1.79 ± 1.75	182 ± 197
SDWA I	_imit	15	50	20,000

Skyshine Results (mrem)



All results are less than 25 mrem per year for 40-hour





QTR

10.3

21.1

17.9

19.1

18 1

17.8

18.9

17.8

18.8

Non-Reportable Spill Performance

CY2002 - 5 non-reportable spills

Date	Nature of Spill
1/17/02	1 pint hydraulic fluid from Bobcat (Bldg. 930)
8/08/02	1 gal hydraulic fluid from Forklift (Bldg. 918)
09/19/02	2 gal ethylene glycol from vehicle (Bldg. 901A)
11/25/02	3-5 gal transformer oil from MPS (Bldg. 930)
02/20/03	1 qt. antifreeze from cont. truck (Bldg. 974)

CY2001 - 5 non-reportable spills



Reportable Spill Performance

CY2002 - 1 reportable spill

Date	Nature of Spill
5/30/02	0.5 gal hydraulic fluid, Const. Vehicle (Bldg. 958)

CY2001 - 4 reportable spills



Regulatory Compliance Performance

1 SPDES violation for ph at 002 outfall

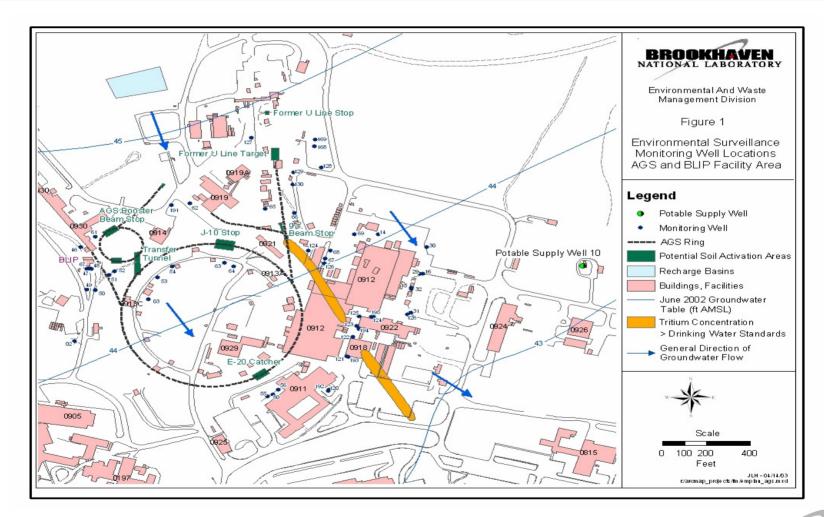


Ray Karol

Groundwater Issues



H3 Groundwater Contamination 2003





New Area of Concern

- RSC Chair asked C-AD to examine highenergy end of Linac in summer 2002
- Soil sample results outside tunnel wall showed that leachate would be >5% of DWS
- Areas examined were BLIP Y-chamber and HEBT water stop



New Area of Concern

- BLIP spur is not examined due to ALARA and difficulty in core drilling in contaminated area (already a known significant loss area)
- Routine well samples downstream BLIP show increase to ~1.5 DWS for tritium in 1/03
- Cannot rule out Linac BLIP Y-chamber soils or injection into Booster as source
- Plan to cap affected Linac/BLIP areas, including injection line from Linac to Booster and HEBT water stops



AGS Berm Cap

- An ESH ADS submitted to BNL and reviewed in summer of 2003
- Proactively cap the entire AGS Berm, anticipating RSVP
- Estimated at ~ \$ 2 x 10⁶



Joel Scott

- Routine Waste
- Waste Minimization
- Legacy Waste Efforts
- Future Legacy Waste Efforts
- Pollution Prevention P2



Routine Waste

Category	Allocation	Actual
Haz/Ind Lab Pak.	850 lbs.	750 lbs.
Haz/Ind barreled	25,000 lbs.	24,000 lbs.
Rad. solid	1200 cu. ft.	1000 cu. ft.
Mixed waste	25 cu. ft.	22 cu. ft.
Rad. liquid	1500 gals.	800 gals.

Waste Minimization Efforts

- Sorting waste bags saved \$10,000
- Using spent resins as fill saved \$20,000
- Filling beam separators with steel saved \$25,000
- Decay in storage of air-handler filters saved \$8000
- Burning 4800 gallons of oil at steam plant saved \$10,000
- Total savings \$73,000



Legacy Issues

SREL aluminum coils (160k lbs.) \$205k low bid





Legacy Issues

Lead (260k lbs.) \$507k low bid



Legacy Issues

Out of service tankers (4) \$150k low bid



Legacy Issues





Legacy Waste Efforts

With money from NP and HEP the following items are gone or are awaiting shipping:

- SREL magnet dismantled, sectioned, characterized, awaiting shipment; 160,000 lbs of steel and aluminum waste, 669 cu. ft.
- Four beam separators loaded internally with legacy steel; 123,700 lbs., 1056 cu, ft. awaiting shipment
- All C-A legacy lead has been shipped and buried;
 167,000 lbs., 456 cu. ft.
- Four legacy tankers cut up, packaged and either at or traveling to burial ground; 80,000 lbs., 240 cu. ft.



Legacy Waste Efforts

- Eleven pieces of old cosmotron magnets awaiting shipment; 200,000 lbs., 700 cu. ft.
- Two B-52 bins of steel and magnets, collimators, etc. from inner mongolia; 60,000 lbs., 624 cu. ft.
- One cement cask loaded with 23 old targets from C,
 C-3, B, A, and D lines; 60 cu. ft.
- One cement cask with legacy magnet, and old targets (20); 60 cu. ft.
- Building 912 cleanup efforts by FES
- Forty liters of activated mercury drained and shipped to ORNL



Pollution Prevention P2

- \$2500 spent with 2003 P2 money on a waste sorting table for C-A waste yard
 - 120 cu. ft. of compactable waste saved this year
 - We estimate that 150 cu. ft./year, \$10,000 will be saved with full years use



Future Legacy Waste Efforts

- Dispose of 3 legacy-waste horns in 2004
- Continue with FES cleanup of B912
- Identify inner-mongolia items as waste and rearrange area for better storage
- Work with ESWMD to dispose of large, hot items
- Dispose of any remaining concrete shield blocks



Future Legacy Waste Efforts

- Vent all 628 and 919 deuterium cylinders and scrap trailers
- Scrap several old Cryo tanks
- Remove Linac Cockcroft-Walton assembly for recycling in 2004
- Dispose of mercury targets debris and reservoir debris (S. Shapiro is POC)



Ed Lessard

Cost Topics

- OSH/EMS/SA Management Systems Maintenance
- Pollution Prevention
- Clean-up
- Fines/Violations
- Injury/Illness
- Monitoring
- Backward-oriented measures
- Future-oriented measures
- OSH/EMS/SA Technical Support



FY03 OSH/EMS/SA Maintenance

	Initiate OSH formal program	0.7 FTE
	OSH and EMS job-specific training	0.5 FTE
	OSH and environmental records	0.2 FTE
	OSH/EMS/SA tracking (ATS)	0.5 FTE
T	otal	1.9 FTE



FY03 Pollution Prevention

 Tritiated water-system upgrades 	\$300,000
1005 floor sealing	\$80,000
 New Rad. Mat. Bldg. (3-y project) 	\$350,000
 Retaining wall at Booster 	\$40,000
 Capping/filling Booster storm pipe 	\$23,000
Total	\$790,000



FY03 Clean-Up

HENP waste funds

\$640,000

NP waste funds

\$3,050,000

Total

\$3,690,000



Fines/Violations

None



FY03 Injury/Illness

3 Recordable Injuries

2 LWD Cases

18 First Aid

Total

\$3,500

\$140,000

\$63,000

\$210,000



FY03 OSH/EMS Monitoring

New g-2 geo-probes and samples	\$50,00
Routine well sampling and analysis	\$80,00

- Inspection / maintenance of caps
- OSH measurements (noise surveys, industrial hygiene and rf measurements, etc.)

0.15 FTE

0.25 FTE

Total

0.4 FTE \$130,000



FY03 Backward-Oriented Measures

 Performance indicator program 	0.1 FTE
Critiques	0.1 FTE
Injury/Illness investigations	0.1 FTE
 Occurrence investigations 	0.0 FTE
Tier 1 inspections	0.2 FTE
 NSF and other external audits 	0.2 FTE
Internal OSH / EMS Audits	0.5 FTE
Total	1.2 FTE



FY03 Future-Oriented Measures

	Management Review	0.1 FTE
•	WOSH Committee	0.1 FTE
•	BNL Safety Improvement Team Participation	0.05 FTE
•	BNL Directors Safety Committee Participation	0.05 FTE
•	Safety Awareness Days	0.7 FTE
•	ASSRC, RSC, ALARA, ESRC reviews	0.3 FTE
•	Ad hoc electrical safety review	0.1 FTE
•	Annual review of OSH hazards	0.1 FTE
•	Annual review of environmental aspects	0.1 FTE
•	Annual review of OSH/EMS training	0.1 FTE
•	Annual review of OSH/EMS management plans	0.1 FTE
•	Annual review of OSH/EMS controls	0.1 FTE
•	Dupont consultants' OSH review	\$40,000
	·	
To	tals	1.9 FTE
		\$40,000



OSH/EMS/SA Technical Support

	Environmental Coordinator	1 FTE
	Environmental Compliance Rep.	1 FTE
	Hazardous Waste Technician	1 FTE
	Work Planning Coordinator	1 FTE
	Tier 1 Coordinator	0.5 FTE
	ESH Coordinator	0.5 FTE
	Training Coordinator	0.5 FTE
Total		5.5 FTE



FY03 OSH/EMS/SA Cost Summary

C	ategory	FTE	Expense
	OSH/EMS/SA Program Maintenance	1.9	-
	Pollution Prevention	-	\$790,000
	Cleanups	_	\$3,690,000
	Fines/Violations	-	-
	Injury/Illness	-	\$210,000
	Monitoring	0.4	\$130,000
	Backward-oriented measures	1.2	-
	Future-oriented measures	1.9	\$40,000
	OSH/EMS/SA Technical Support	5.5	-
	Total	10.9	\$4,860,000



Summary of Management Review Presentations

- OSH formal program is initiated
- EMS program is mature and part of C-AD culture
- SA helps ensure performance objectives are being met
- Improvement actions are identified and on-going for:
 - Electrical safety
 - Fire protection
 - Injury/illness reduction
 - Pollution prevention
 - Waste management
 - Legacy waste removal



Senior Management Evaluation

 Purpose: identify improvement actions and assign responsibility and resources to implement



Management Question 1

- Are the OSH/EMS/SA programs effective in achieving policy commitments?
 - Compliance?
 - Pollution prevention?
 - Injury/illness reduction?
 - Community outreach?
 - Clean-up?
 - Continual improvement?



Response to Management Question 1

- Are the OSH/EMS/SA programs effective in achieving policy commitments?
 - · Compliance?
 - Pollution prevention?
 - Injury/illness reduction?
 - Community outreach?
 - Clean-up?
 - Continual improvement?

Issues

- In the area of injury prevention, need to fix B912 roof, fix pot holes and improve response to snow-storms (slips and falls)
- In the area of pollution prevention, need to add caps over activated soils and remove PCB capacitors at Linac



Management Question 2

Are the OSH/EMS/SA programs effective in achieving the objectives and performance measures?



Response to Management Question 2

- Are the OSH/EMS/SA programs effective in achieving the objectives and performance measures?
- Issues
 - None, objectives and performance measures are met



Management Question 3

- Are the OSH/EMS/SA programs adequate in terms of:
 - Identifying significant environmental aspects and impacts?
 - Identifying significant occupational safety and health hazards?
 - Resource allocation?
 - Information systems?
 - Organizational issues
 - staff expertise?
 - procedural requirements?



Response to Management Question 3

- Are the OSH/EMS/SA programs adequate in terms of:
 - Identifying significant environmental aspects and impacts?
 - Identifying significant occupational safety and health hazards?
 - Resource allocation?
 - Information systems?
 - · Organizational issues
 - staff expertise?
 - procedural requirements?

Issues

- OSH program in its infancy and expected to progress well
- ESHQ resources are at absolute minimum to support expectations
- Fire protection upgrades are slow
- BNL needs to standardize the OSH management system



Management Question 4

- Are the objectives and performance measures for OSH/EMS/SA programs suitable in terms of:
 - Environmental impacts and current conditions?
 - Occupational hazards and current conditions?
 - Concerns of stakeholders?
 - Current and future regulatory requirements?
 - Business interests?
 - Technological capability?
 - Internal organizational or process changes?
 - Should additional measures be established?



Response to Management Question 4

- Are the objectives and performance measures for OSH/EMS/SA programs suitable in terms of:
 - Environmental impacts and current conditions?
 - Occupational hazards and current conditions?
 - · Concerns of stakeholders?
 - Current and future regulatory requirements?
 - Business interests?
 - Technological capability?
 - Internal organizational or process changes?
 - Should additional measures be established?

Issue

- Objectives needed for OSHA-related facility changes
- Continuing need to streamline/integrate OSH/EMS/SA programs



Management Question 5

- Recommended revisions to:
 - OSH policy and commitments?
 - Environmental policy and commitments?
 - Self-assessment policy and commitments?
 - Objectives and performance measures?
 - Elements of OSH?
 - Elements of EMS?
 - Elements of SA?



Response to Management Question 5

- Recommended revisions to:
 - OSH policy and commitments?
 - Environmental policy and commitments?
 - Self-assessment policy and commitments?
 - Objectives and performance measures?
 - Elements of OSH?
 - Elements of EMS?
 - Elements of SA?

Issues

 BNL level strategy is needed for "equivalence" (i.e., preparing technical justifications where appropriate) in order to meet OSHA and NRC rules

